

Waterbody: Heavenly Valley Creek	TMDL: Sediment	Updated: 8/5/10 Carly Nilson
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Current Compliance with Sediment Target:

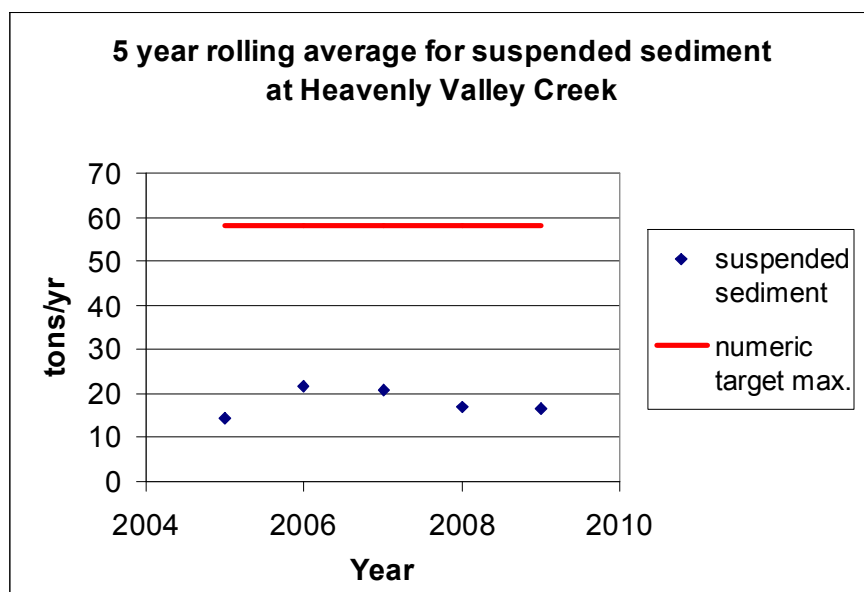


[Refer to legend for description](#)

Background Information:

- *Date of approval:* January 2001 (Lahontan Region); September 30, 2002 (USEPA)
- *Basis for TMDL:* With the development of the ski resort in 1955/1956, the creek has been altered by hydromodification, including a snowmaking reservoir and the diversion of part of the creek into a culvert, and by erosion of the hillslope
- *Responsible parties:* U.S.D.A. Forest Service, Lake Tahoe Basin Management Unit and Heavenly Ski Resort
- *Target:* The TMDL will be met when the instream total sediment load does not exceed 58 tons/yr as a 5 year rolling average, as measured at the Property Line monitoring station
- *Attainment of TMDL:* instream standards projected to occur within 20 years after final approval of TMDL

Figure of current data from 2001-2009:



Permits that include TMDL

implementation measures: Waste Discharge Requirement R6T-2003-0032 (2003), including amendments R6T-20030032R1 (2006) and R6T-2003-0032A2 (2007)

Period of evaluation: January 2001-December 2008 (data for suspended sediment included 2009)

Note: This status report only reflects compliance with the Heavenly Valley Creek TMDL and through the time period of evaluation.

Target	Evaluation Schedule	Source Reported	2010 Compliance Comments
Instream total sediment load maximum of 58 tons/yr as a 5 year rolling average, as measured at the Property Line monitoring station	Annually, as a 5 year rolling average	Annual Monitoring Reports and Comprehensive Monitoring Report ³	Meets requirements: Refer to Table 1 and Figure 1 .
USFS Region 4 "Stream Condition Inventory" improving trends in channel morphology over time	Conducted every 3 years beginning in 2006	Annual Monitoring Report	Meets requirements: The Pfankuch method was replaced with the Stream Condition Inventory in 2006. No trends to be evaluated as there is currently only 1 data set from 2006.
Macroinvertebrate community health improving to approach conditions at Hidden Valley Creek	Sampling is required at a frequency of 2 years "on" and 2 years "off" at 4 sampling locations starting in 2006-07	Annual Monitoring Report	Meets requirements: 1 set of samples was completed in 2006-07 with three Heavenly Valley Creek sites to one Hidden Valley Creek site. The Upper Heavenly Valley Creek at Sky Meadows showed "impaired conditions" for both IBI (refer to Table 2) and RIVPACS (refer to Table 3), although there is no comparable site at Hidden Valley Creek to determine impairment. The other two sites did not show impairment and were closer to the Hidden Valley Creek value. The next set of samples will occur in 2010-11. A new Hidden Valley Creek site will be chosen for the next sampling round.
Maintaining/implementing BMPs for roads and ski runs with effectiveness reported ¹	On-going basis	Annual Monitoring Report	Meets requirements: Perform annual BMP evaluations for both permanent and temporary BMPs and include as an appendix in the Annual Monitoring Reports.
Overall rating of "good" or better for effective soil cover on ski runs and roads using the LTBMU evaluation criteria ²	Complete by 2021; no evaluation schedule defined	Annual Monitoring Report	In progress: Last evaluation was included in the LTBMU 2003 Comprehensive Monitoring Report with a 21% increase in cover. In 2009 a flyover occurred and the different types of cover will be categorized. Ground-truthing will further detail specific sites. Results from this new monitoring methodology will be included in the 2009 and 2010 Annual Monitoring Reports.

¹Incorporated by reference in Tahoe Regional Planning Agency (TRPA) Draft EIR/EIS/EIS for Heavenly Ski Resort Master Plan (1995), pages 4.1-50 to 4.1-72 (CWE Soil Erosion Reduction Program) and Appendices H and I; TRPA (1996), pages 6.4-1 to 6.5-6 (Revised Mitigation and Monitoring Plan); and U.S. Forest Service (1998), Appendix G (CWE Technical Memorandum No. 1).

²Incorporated by reference in TRPA (1995) Appendix I, Road and Run Segment Mitigation Tables; Hazelhurst and Widegren (1998) pages 3.1 to 3.13 (on effective soil cover evaluation); and Hazelhurst *et al.*, 1999, pages 3.1 to 3.7 and 6.3 to 6.7 (on effective soil cover evaluation)

³Annual and Comprehensive Monitoring Reports are submitted to Lahontan for review as part of the Heavenly Ski Resort, Waste Discharge Requirements permit

Implementation Measure	Evaluation Schedule	Source Reported	2010 Compliance Comments
Abandon and restore 7.59 acres if existing unpaved roads ¹	Complete by 2006	TRPA Land Coverage Verification permits	Meets requirements: reported in Tahoe Regional Planning Agency Land Coverage Verification Letter to Heavenly Ski Resort December 5, 2005
Stabilize 21.10 acres of existing roads which will remain in use ¹	Complete by 2006	2003 and 2006 Forest Service Comprehensive Monitoring Reports	Meets requirements: reported in Heavenly Ski Resort TMDL Compliance Report for stabilized and treated summer maintenance roads submitted to Lahontan July 16, 2010
Restore 182 acres of existing ski runs ¹	Complete by 2006	2003 and 2006 Forest Service Comprehensive Monitoring Reports	Meets requirements: reported in Heavenly Ski Resort TMDL Compliance Report for stabilized and treated ski runs submitted to Lahontan July 16, 2010 and Heavenly Ski Run Erosion Control Measures since 2001/2002 spreadsheet submitted to Lahontan July 30, 2010
Maintain BMPS as necessary ¹	On-going basis	Annual Monitoring Report ²	Meets requirements: BMP monitoring frequency is biweekly during construction and after precipitation events and 1-, 3-, 6-, and 9-year post construction. Information is included in the Annual Monitoring Reports.
Review success of specific BMPs at specific sites; identify and implement improvements through adaptive management approach ¹	On-going basis	Annual Monitoring Report	Meets requirements: BMP effectiveness monitoring and recommendations conducted by Resource Concepts, Inc. from 2001-2008.
Conduct a comprehensive review of progress toward watershed restoration and attainment of water quality standards and identify needs for change through adaptive management system ¹	On-going basis	Annual Monitoring Reports and Comprehensive Monitoring Report	Meets requirements: Included in the Annual and Comprehensive Monitoring Reports.

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²Annual and Comprehensive Monitoring Reports are submitted to Lahontan for review as part of the Heavenly Ski Corporation permit

Table 1. Heavenly Valley Creek Property Line (43-HV-C3) monitoring station instream suspended sediment loading.

Water Year	Suspended Sediment (tons/year)	Rolling 5 year average of Suspended Sediment (tons/year)
2001	6.6	-
2002	6.2	-
2003	18	-
2004	4.1	-
2005	36.9	14.4
2006	42.6	21.6
2007	1.3	20.6
2008	0.6	17.1
2009	0.5	16.4

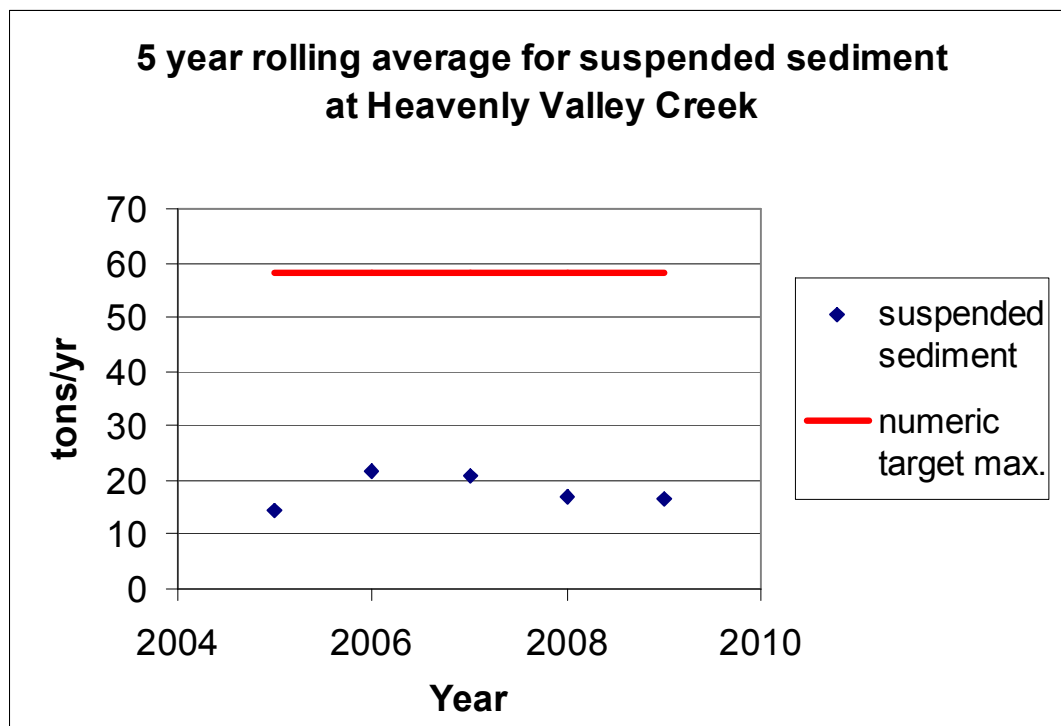


Figure 1. Heavenly Valley Creek Property Line monitoring site with monitoring data showing it under the maximum numeric target of 58 mg/L suspended sediment as a 5 year rolling average.

Table 2. Index of Biotic Integrity (IBI) scores for Heavenly Valley Creek and Hidden Valley Creek sampling sites. IBI score less than 62 indicative of impaired conditions.

sampling site	Total taxa richness	EPT richness	% Chironomid richness	Lahontan 10 metric IBI score
2006				
Heavenly Valley Creek -Sky Meadows	35	14	34.3	54.25
Heavenly Valley Creek - Below Patsy's	36	19	25	63.38
Heavenly Valley Creek - Property Line	33	22	18.2	74.64
Hidden Valley Creek - Lower	48	30	14.6	89.00
2007				
Heavenly Valley Creek -Sky Meadows	23	6	52.2	26.73
Heavenly Valley Creek - Below Patsy's	43	19	30.2	71.69
Heavenly Valley Creek - Property Line	45	22	26.7	78.59
Hidden Valley Creek - Lower	48	28	18.8	91.00

Table 3. River Invertebrate Prediction and Classification System (RIVPACS) results for sites on Heavenly Valley and Hidden Valley Creeks, 2006-2007.

Site	Year	P > 0.0			P > 0/5			SD O/E (2001-2007)
		O	E	O/E	O	E	O/E	
Heavenly Valley Creek -Sky Meadow	2006	25	32.36876	0.77	10	14.95028	0.67	0.14
Heavenly Valley Creek -Sky Meadow	2007	19	32.26876	0.59	8	14.95028	0.54	
Heavenly Valley Creek - Below Patsy's	2006	20	32.98008	0.61	10	13.7899	0.73	0.16
Heavenly Valley Creek - Below Patsy's	2007	29	32.98008	0.88	11	13.7899	0.8	
Heavenly Valley Creek - Property Line	2006	22	33.0296	0.67	12	13.84578	0.87	0.26
Heavenly Valley Creek - Property Line	2007	32	33.0296	0.97	14	13.84578	1.01	
Hidden Valley Creek - Lower	2006	30	33.35656	0.9	11	14.36805	0.77	0.06
Hidden Valley Creek - Lower	2007	35	33.35656	1.05	12	14.36805	0.84	

Note: RIVPACS assesses the biological conditions of streams by comparing observed assemblage composition (O) with an expected assemblage composition derived from reference site observations (E). The ratio of the 2 values (O/E) can be interpreted as a measure of taxonomic completeness. Values of O/E that are near 1 at a test suggest that the site is comparable to reference sites, whereas values that differ substantially from 1 suggest that the site is degraded.